AMENDMENTS TO THE SPECIFICATION:

Please amend the paragraph beginning at page 1, line 16, as follows:

On fossil fuels such as petroleum and the like, there are a fear of future resource depletion and a problem of carbon dioxide emission causing a global warming phenomenon. In recent years, photo voltaic systems become widespread particularly ~~by~~ due to growing environmental concerns and the cost-reduction of systems and are expected as alternative energy sources of fossil fuels such as petroleum and the like.

Please amend the paragraphs beginning at page 8, line 25 through page 9, line 1, as follows:

The present invention includes at least the first ~~present invention~~ aspect and the second ~~present invention~~ aspect, and the first ~~present invention~~ aspect is provided for solving at least the above-mentioned first problems and the second ~~present invention~~ aspect is provided for solving at least the above-mentioned second problems.

(First ~~Present Invention~~ Aspect)

A substrate for a photoelectric conversion device of the first ~~present invention~~ aspect includes a first transparent conductive layer formed on at least a part of the surface region of a substrate and the first transparent conductive layer has at least an opening portion exposing the substrate.

Please amend the paragraphs beginning at page 9, lines 7-12, as follows:

Further, preferably, the substrate for a photoelectric conversion device of the first ~~present invention~~ aspect further includes a second transparent conductive layer covering the opening portion of the first transparent conductive layer on the first transparent conductive layer.

(Second ~~Present Invention~~ Aspect)

A stacked photoelectric conversion device of the second ~~present invention~~ aspect includes a plurality of photoelectric conversion layers with these layers stacked, and an intermediate layer is sandwiched between at least a pair of adjacent photoelectric conversion layers and the intermediate layer has at least an opening portion, and a pair of photoelectric conversion layers, between which the intermediate layer is sandwiched, come into contact with each other through the above-mentioned opening portion.

Please amend the paragraphs beginning at page 9, lines 22-23, as follows:

~~Effects of First Present Invention~~

In accordance with the first ~~present invention~~ aspect, the first transparent conductive layer has at least an opening portion and therefore light can pass through the opening portion at high transmittance. Therefore, in accordance with the first ~~present invention~~ aspect, the transmittance of the first transparent conductive layer can be substantially enhanced even when the

film thickness of the first transparent conductive layer is thick. And, when a photoelectric conversion device is fabricated using the substrate for a photoelectric conversion device of the first ~~present invention~~ aspect, the photoelectric conversion efficiency of the photoelectric conversion device can be enhanced.

Please amend the paragraphs beginning at page 10, lines 11-25, as follows:

And, by further providing the substrate for a photoelectric conversion device of the first ~~present invention~~ aspect with a second transparent conductive layer covering the opening portion of the first transparent conductive layer on the first transparent conductive layer, a sheet resistance of the overall transparent conductive layer can be reduced. And, the second transparent conductive layer can be formed so as to have a thinner film thickness than that of the first transparent conductive layer, and a reduction in the transmittance of the overall transparent conductive layer can be made small. Accordingly, in this case, it is possible to achieve high transmittance, a high haze index and a low sheet resistance simultaneously. And, when a photoelectric conversion device is fabricated using this substrate for a photoelectric conversion device, the photoelectric conversion efficiency of the photoelectric conversion device can be further enhanced.

~~(Effects of Second Present Invention)~~

Please amend the paragraphs beginning at page 10, line 29 through page 11, line 23, as follows:

In accordance with the second ~~present invention~~ aspect, since the intermediate layer has at least an opening portion, light having reached the intermediate layer can pass through the intermediate layer at high transmittance. Consequently, the quantity of incident light entering the bottom cell increases.

In accordance with the second ~~present invention~~ aspect, the quantity of incident light entering the bottom cell can be controlled by controlling a size, a density or the like of the opening portion formed in the intermediate layer. Therefore, it is possible to form the opening portion in such a way that the short circuit current density of the bottom cell becomes equal to that of the top cell and to obtain a high-efficiency stacked photoelectric conversion device can be obtained.

Generally, the top cell is made of a material having a large bandgap, and therefore much of the short-wavelength light is absorbed in the top cell and the long-wavelength light is not absorbed so much. Accordingly, in this case, much of the long-wavelength light reaches the intermediate layer. When the intermediate layer does not have the opening portions, most of this long-wavelength light is reflected and is not used for the photoelectric conversion. But, in accordance with the second ~~present invention~~ aspect, since the intermediate layer has opening portions, this long-wavelength light passes

through the intermediate layer efficiently and contributes to photoelectric conversion in the bottom cell. Thus, in accordance with the second ~~present invention~~ aspect, the efficiency in use of the long-wavelength light can be enhanced.

And, thus, in accordance with the second ~~present invention~~ aspect, since, particularly, the efficiency in use of the long-wavelength light can be enhanced and by controlling a size, a density or the like of the opening portion, high current values can be realized in both the top cell and the bottom cell, a stacked photoelectric conversion device having high photoelectric conversion efficiency can be obtained.

Please amend the paragraphs beginning at page 12, line 3 through page 13, line 4, as follows:

FIG. 1 is a sectional view showing a substrate for a photoelectric conversion device of Example 1 of the first aspect of the present invention,

FIG. 2 is a sectional view showing a substrate for a photoelectric conversion device of Example 2 of the first aspect of the present invention,

FIG. 3 is a sectional view showing a photoelectric conversion device of Example 3 of the first aspect of the present invention,

FIG. 4 is a sectional view showing a photoelectric conversion device of Example 4 of the first aspect of the present invention,

FIG. 5 is a sectional view showing a stacked photoelectric conversion device of Example 5 of the first aspect of the present invention,

FIG. 6 is a sectional view showing a stacked photoelectric conversion device of Example 6 of the first aspect of the present invention,

FIG. 7 is a sectional view showing a stacked photoelectric conversion device of Example 7 of the first aspect of the present invention,

FIG. 8 is a sectional view showing a stacked photoelectric conversion device of Example 8 of the first aspect of the present invention,

FIG. 9 is a sectional view showing a stacked photoelectric conversion device of Example 9 of the first aspect of the present invention,

FIG. 10 is a sectional view showing a stacked photoelectric conversion device of Example 10 of the first aspect of the present invention,

FIG. 11 is a sectional view showing a stacked photoelectric conversion device of Example 11 of the first aspect of the present invention,

FIG. 12 is a sectional view showing a stacked photoelectric conversion device of Example 12 of the first aspect of the present invention,

FIG. 13 is a graph showing a relationship between an aperture ratio and a short circuit current density of a first transparent conductive layer of Examples 13 to 21 of the first aspect of the present invention,

FIG. 14 is a graph showing a relationship between a film thickness and a photoelectric conversion efficiency of a second transparent conductive layer of Examples 22 to 28 of the first aspect of the present invention,

FIG. 15 is a sectional view showing a structure of a stacked photoelectric conversion device of Examples 37 to 47 of the second aspect of the present invention,

Please amend the paragraphs beginning at page 13, lines 8-17, as follows:

FIG. 17 is a plan view showing a shape of an opening portion of an intermediate layer of the second aspect of the present invention,

FIG. 18 is a plan view showing a shape of an opening portion of an intermediate layer of the second aspect of the present invention,

FIG. 19 is a plan view showing a shape of an opening portion of an intermediate layer of the second aspect of the present invention,

FIG. 20 is a graph showing a relationship between an aperture ratio and a short circuit current density of an intermediate layer of Examples 38 to 47 and Comparative Examples 7 to 8 of the second aspect of the present invention, and

FIG. 21 is a graph showing a relationship between an aperture ratio and a photoelectric conversion efficiency of an intermediate layer of Examples 38 to 47 and Comparative Examples 7 to 8 of the second aspect of the present invention.

Please amend the paragraphs beginning at page 15, lines 8-16, as follows:

Embodiment of First ~~Present Invention~~Aspect

1. First Embodiment

A substrate for a photoelectric conversion device of the first embodiment of the first ~~present invention~~ aspect includes a first transparent conductive layer formed on at least a part of the surface region of a substrate and the first transparent conductive layer has at least an opening portion exposing the substrate.

1-1. Substrate

In a photoelectric conversion device having a substrate structure of a superstrate type, a transparent substrate is employed as the above substrate, but in a photoelectric conversion device having a substrate structure of a substrate type, a non-transparent substrate such as stainless steel or the like may be used as the above substrate. Hereinafter, a substrate for a photoelectric conversion device having a structure of a superstrate type will be described, but these descriptions can also be applied to the case where the photoelectric conversion device has a structure of a substrate type. As a material of the transparent substrate, glass, resin having heat resistance such as polyimide or polyvinyl, or a laminate thereof or the like can be used. Thickness of the transparent substrate is not particularly limited and the substrate may be one having appropriate strength and weight which can support the structure. And,

a texture structure may be formed on ~~it~~ its surface. Further, its surface may be coated with a metal film, a transparent conductive film, or an insulating film.

Please amend the paragraph beginning at page 16, line 22, as follows:

The first transparent conductive layer has at least an opening portion. The first transparent conductive layer preferably has a plurality of opening portions in order to effectively improve substantial transmittance of the first transparent conductive layer. At least an opening portion may be formed in at least a part region of the first transparent conductive layer, but the opening portions are preferably distributed evenly throughout the first transparent conductive layer. The opening portion can be identified by observing the transparent conductive layer with an optical microscope. Herein, the above-mentioned opening portion does not include a groove for separating a transparent electrode provided for forming an integrated structure in which a plurality of photoelectric conversion cells are electrically connected in series on an insulating substrate, as described in a paragraph of Prior Art in Japanese Unexamined Patent Publication No. HEI 11 (1999)-186573. More specifically, in the above integrated thin film photoelectric conversion device, by dividing the transparent electrode by laser scribing for the purpose of electrically isolating the above photoelectric conversion cells, an opening portion through, which the insulating substrate is exposed onto the transparent electrode, is formed, but since this is not intended for improving the transmittance of the transparent

electrode, this does not apply to the scope of claims of the first ~~present invention~~ aspect.

Please amend the paragraph beginning at page 18, line 5, as follows:

In accordance with the first ~~present invention~~ aspect, since light can pass through the opening portion at high transmittance, the transmittance of the first transparent conductive layer can be substantially enhanced even when the film thickness of the first transparent conductive layer is thick.

Please amend the paragraph beginning at page 21, line 27, as follows:

Further, an "opening portion" refers to a region where the first transparent conductive layer is ~~adequately thinned or~~ fully removed and optical transmittance observed with an optical microscope is substantially constant

Please amend the paragraph beginning at page 24, line 6, as follows:

In a photoelectric conversion device of the second embodiment of the first ~~present invention~~ aspect, a photoelectric conversion layer and a backside electrode layer are stacked in this order on the substrate for a photoelectric conversion device in the first embodiment. Hereinafter, a photoelectric conversion device having a structure of a superstrate type will be described, but these descriptions can also be applied to the case where the photoelectric conversion device has a structure of a substrate type.

Please amend the paragraph beginning at page 27, line 12, as follows:

The backside electrode layer can be expected to improve the photoelectric conversion efficiency by reflecting the light which has not been fully absorbed in the photoelectric conversion layer to return it to the photoelectric conversion layer again. However, when the first ~~present invention~~ aspect is applied to the structure of a substrate type, the above-mentioned backside electrode layer is preferably in the shape of a grid such as a shape of comb or the like, which does not cover the surface uniformly.

Please amend the paragraph beginning at page 27, line 26, as follows:

In a stacked photoelectric conversion device of the third embodiment of the first ~~present invention~~ aspect, a plurality of photoelectric conversion layers and a backside electrode layer are stacked in this order on the substrate for a photoelectric conversion device in the first embodiment. Hereinafter, a stacked photoelectric conversion device having a structure of a superstrate type will be described, but these descriptions can also be applied to the case where the stacked photoelectric conversion device has a structure of a substrate type.

Please amend the paragraph beginning at page 29, line 29, as follows:

The first intermediate layer preferably has at least an opening portion through which a pair of photoelectric conversion layers, between which the first

intermediate layer is sandwiched, come into contact with each other. The opening portion of the first intermediate layer can be identified by observing the transparent conductive layer with an optical microscope or the like. And, "an opening portion" in this case means a region where the first intermediate layer is ~~adequately thinned or~~ fully removed and optical transmittance observed with an optical microscope is substantially constant.

Please amend the paragraph beginning at page 32, line 13 through page 33, line 4, as follows:

Embodiment of Second ~~Present Invention~~Aspect

A stacked photoelectric conversion device of the second ~~present invention~~ aspect includes a plurality of photoelectric conversion layers with these layers stacked, and an intermediate layer is sandwiched between at least a pair of adjacent photoelectric conversion layers and the intermediate layer has at least an opening portion, and a pair of photoelectric conversion layers, between which the intermediate layer is sandwiched, come into contact with each other through the above-mentioned opening portion. The photoelectric conversion layer may be composed of two layers or three or more layers, and the intermediate layer having at least an opening portion may be formed between at least a pair of adjacent photoelectric conversion layers of these photoelectric conversion layers.

And, noting a pair of photoelectric conversion layers between which the intermediate layer is sandwiched, the above description can translate to that the stacked photoelectric conversion device of the second ~~present invention~~ aspect includes a first photoelectric conversion layer, an intermediate layer and a second photoelectric conversion layer with these layers stacked in this order, and the intermediate layer has at least an opening portion, and a first photoelectric conversion layer and a second photoelectric conversion layer come into contact with each other through the above-mentioned opening portion.

The stacked photoelectric conversion device of the second ~~present invention~~ aspect is specifically in the following form.

Please amend the paragraph beginning at page 33, line 8, as follows:

A photoelectric conversion device of the first embodiment of the second ~~present invention~~ aspect includes a front transparent conductive layer, a plurality of photoelectric conversion layers and a backside electrode layer with these layers stacked in this order on a transparent substrate, and an intermediate layer is sandwiched between at least a pair of adjacent photoelectric conversion layers and the intermediate layer has at least an opening portion, and a pair of photoelectric conversion layers (referred to as a first photoelectric conversion layer and a second photoelectric conversion layer in order from a transparent substrate side), between which the intermediate

layer is sandwiched, come into contact with each other through the above-mentioned opening portion.

Please amend the paragraph beginning at page 37, line 25, as follows:

The intermediate layer is formed on the first photoelectric conversion layer. In the intermediate layer, at least an opening portion is formed so that the first photoelectric conversion layer is exposed. An opening portion is a region through which the first photoelectric conversion layer and the second photoelectric conversion layer, between which the intermediate layer is sandwiched, come into contact with each other. More specifically, aspects of the opening portion include the case where the opening portions in the form of isle are interspersed in the intermediate layer, as shown in FIG. 17, and the case where the intermediate layer in the form of isle are formed in the opening portion, as shown in FIG. 18. Further, as shown in, for example, FIG. 19, in the intermediate layer in the form of isle, there may exist a region through which the first photoelectric conversion layer and the second photoelectric conversion layer come into contact with each other. Further, number of opening portions, and a shape, a size and an arrangement of the opening portion vary. Since the intermediate layer has at least an opening portion, light having reached the intermediate layer can pass through the intermediate layer at high transmittance. Consequently, the quantity of incident light entering the second photoelectric conversion layer increases. The quantity of incident light

entering the second photoelectric conversion layer can be controlled by controlling a size, a density or the like of the opening portion formed in the intermediate layer. Therefore, it is possible to form the opening portion in such a way that the short circuit current density of the first photoelectric conversion layer becomes equal to that of the second photoelectric conversion layer and thus a high-efficiency stacked photoelectric conversion device can be obtained. Further, number of the opening portions may be single or multiple as long as effects of the second ~~present invention~~ aspect are attained.

Please amend the paragraph beginning at page 44, line 15, as follows:

A photoelectric conversion device of the second embodiment of the second ~~present invention~~ aspect includes a plurality of photoelectric conversion layers, a transparent conductive layer and a grid electrode with these layers stacked in this order on a substrate made of metal or a substrate, the surface of which is coated with metal, and an intermediate layer is sandwiched between at least a pair of adjacent photoelectric conversion layers and the intermediate layer has at least an opening portion, and a pair of photoelectric conversion layers (referred to as a first photoelectric conversion layer and a second photoelectric conversion layer in order from a substrate side), between which the intermediate layer is sandwiched, come into contact with each other through the above-mentioned opening portion.

Please amend the paragraphs beginning at page 46, line 28 through page 47, line 7, as follows:

Further, descriptions of the first ~~present invention~~ aspect hold for the second ~~present invention~~ aspect as long as they are not contrary to their gist, and the reverse holds true. For example, the stacked photoelectric conversion device of the second ~~present invention~~ aspect can be formed using the substrate of the first ~~present invention~~ aspect.

Hereinafter, the examples of the first and the second ~~present inventions~~ aspects will be described.

Examples of the First ~~Present Invention~~ Aspect

Please amend the paragraph beginning at page 47, line 13, as follows:

Hereinafter, examples of the first ~~present invention~~ aspect will be described.

Please amend the heading beginning at page 63, line 2, as follows:

Examples of the First ~~Present Invention~~ Aspect

Please amend the paragraphs beginning at page 98, lines 2-3, as follows:

Examples of the Second ~~Present Invention~~ Aspect

Hereinafter, examples of the second ~~present invention~~ aspect will be described.